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Discussion: Narrow Money, Broad Money, and the Transmission of Monetary Policy

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Monetary policy and theory have been greatly transformed since Dale Henderson, Richard Porter, and Peter Tinsley (HPT) first crossed the Board's threshold more than thirty years ago. Judging from the sustained levels of robust growth and moderate rates of inflation in the United States since the early 1980s, both theory and policy have moved in a welfare-improving direction. The dramatic evolution of monetary policy during HPT's tenure simply cannot be overstated. A revolution took place during their watch, and as the custodians and facilitators of research at the Federal Reserve Board, these three amigos should certainly take some credit.

In my opinion, the fundamental change in policy during HPT's tenure was the deregulation and the market-based evolution of monetary policy. On the domestic side of monetary policy, the Federal Reserve Board ended the active management of margin rates and reserve requirements that had earlier been considered important tools of monetary policy. As well, the end of Regulation Q brought deregulation to the setting of deposit rates and allowed banks and financial institutions to offer new kinds of deposit-type products to their customers. On the international side, too, the Federal Reserve Board has operated in a post-Bretton Woods regime of floating exchange rates, and it has made great strides in the past ten years to avoid actively intervening in foreign exchange markets.

Not only has the Federal Reserve Board changed during HPT's tenure with respect to allowing a more market-based approach to implementing monetary policy, but it has also adopted a stronger, though largely unstated, partial policy commitment to low inflation. Operationally, the Board has somewhat improved on transparency, especially if you like 150-word documents that get released eight times a year. And the Board has devoted a large amount of resources to make operational the policy implementation of disciplined approaches for stabilization of real growth and low inflation, such as those suggested by McCallum (1988) and Taylor (1993).

While the Federal Reserve Board's approach to monetary policy was changing, the academic study of applied and theoretical monetary economics was changing as well. When HPT came to the Board thirty years ago, applied monetary economics involved large-scale models, optimal control theory, and a tendency to recommend policies that encouraged fine-tuning. And then came the exodus. The policy irrelevance debate of Sargent and Wallace (1975), the Lucas Critique (1976) of simulating policy changes when deep parameters are not identified, and the real business cycle models of Kydland and Prescott (1982) and Long and Plosser (1983) de-emphasized the academic study of applied monetary economics for a generation or two of graduate students.

The study of intermediation and the re-emergence of Gurley and Shaw (1960) resuscitated monetary economics from its coma. The seminal survey paper by Gertler (1988), followed by the disintermediation process that accompanied the U.S. slowdown in the early 1990s, made economists interested once more in further integrating monetary economics with financial intermediation to trace out the macroeconomic effects and policy implications of monetary economics. As cogently summarized in Bernanke and Gertler (1995), the "black box" of the monetary transmission mechanism was a worthy topic of inquiry—and macroeconomics, monetary economics, and policymaking found a useful focal point in the external finance premium—that is, the extent to which external financing is more costly than internal financing. The result was that the study of monetary economics became filled with more "channels" than my satellite television service.

And then the pendulum swung again, the turning point somewhat inadvertently being John Taylor's (1993) contribution to formalizing an interest rate, rule-based approach to monetary policy that incorporated a low inflation objective. The monetary economics literature decisively changed course and moved toward the building of small, theory-based models that were useful for policy, in which expectations were explicitly incorporated. The byproduct was an analytic treatment of Federal Reserve objectives as well as the rule-based procedure for implementing monetary policy that were model-based. This literature was synthesized and standardized in the survey by Clarida, Gali, Gertler (1999) and has come to its logical conclusion, *ad absurdum*, in Woodford's (2003) tome.

In my opinion, though, this recent fad of monetary economics has swung too far away from money. Now I know that the monetary aggregates can often let us down, and I appreciate how financial innovation has made real economic transactions more cashless; but if we throw money out of the models—and banking, credit and financial intermediation along with it—we return to the world outside the "black box," where it becomes fashionable once more to talk exclusively about the IS curve. And that leaves us, paradoxically enough, back in a world of optimal control and fine-tuning of interest rates that is reminiscent of the world that HPT inherited when they came to the Board, albeit now with underlying models based on simple theory.

I do not think that I am just being cranky on this point because a quick examination of the index to Woodford's (2003) seminal book will bear me out. The following terms are not listed in the index to his book: "banking," "credit," "intermediation," "financial intermediation," and "external finance premium." And these were all the terms that drew us into the "black box" of how monetary policy worked just a decade ago. Their absence also leads me to the following questions. First, upon how many pillars should monetary policy stand? Second, should central banks be also concerned with the health of the economy's financial intermediation? For historically, the monetary aggregates have provided useful information

for the formation of policy during unusual episodes of inflation and deflation as well as periods of financial stress.

It is in light of these two questions that Marvin Goodfriend's paper, "Narrow Money, Broad Money, and the Transmission of Monetary Policy," is a breath of fresh air. For ultimately, we must apply the discipline of implementing optimal robust monetary policy, albeit with a short-term interbank interest rate, in a monetary model in which financial intermediation is taken seriously. And that is what Marvin's paper does. Of course, not to be outdone, Marvin embraces this mission with gusto—perhaps a bit too much. So there is a plethora of assets and their associated prices to keep track of in the paper, which has few shortcuts and little hand waving.

The setup of Marvin's model is as follows: Households face idiosyncratic risk to their incomes and must choose consumption and their portfolio composition before this risk is realized. Hence, households take out loans to finance their interest-earning deposits, and they pay an overdraft fee if they have too few deposits. Banks are not ciphers here as they take on deposits as liabilities, but on their asset side they hold required reserves as well as loans, which are produced with monitoring effort and collateral made up of capital and government bonds. Households choose the amount of currency (**c**), loan-monitoring hours (**m**), loans (**L**), deposits (**D**), government bonds (**B**), and capital to hold next period (**K**), to maximize their utility subject to the standard household budget constraints as well as to the fact that the bank's balance sheet must be balanced. Clearly, an external finance premium develops between the interest rate on loans and deposits because banks must be compensated for the service they provide in monitoring loans with effort and collateral.[1] In equilibrium, asset prices are determined for loans, deposits, government bonds and capital, and the overall price level and equilibrium amount of monitoring effort are determined.

One of the fundamental benefits of the paper is that by allowing for financial intermediation, the demand for and supply of broad money is reintroduced to policy-oriented macroeconomics after its untimely, though temporary, demise—see Friedman (2004) for a premature obituary of the LM curve.[2]

Rather than focus on Marvin's intellectual odyssey, I think that it is essential to the legacy of HPT that the policy implications from his paper should be the focal point of my remaining discussion. To focus the policy implications, let's just trace through two types of shocks that policymakers

1. Note that the external finance premium is motivated by a moral-hazard-type argument rather than an adverse selection argument. As such, there are other motivations for the external finance premium that are not considered in this paper.

2. To be fair, Dale Henderson pointed to the fact that James Tobin, nowhere near your run-of-the-mill monetarist, emphasized the role of financial and asset market conditions in the conduct of monetary policy. Nevertheless, since the standard workhorse model of monetary policy now appears to be a model with no money and no LM curve and is clearly labeled New Keynesian, I think that it is fair to say that my criticism would be made by all monetarists, even if it would also be made by some non-monetarists as well.

routinely face: (1) a banking shock (that is, a shock to financial intermediation, **F**) and (2) a shock to the expected future price of capital (that is, a temporary shocks to output, $\mathbf{E}_t\ \mathbf{q}_{t+1}$). Both shocks are discussed in Marvin's paper, though the model's policy implications are underplayed. In considering the optimal policy response, let's also keep in mind how the policy response in Marvin's paper contrasts with current central bank philosophy.

Let's first trace out the central bank's optimal response to a temporary shock to intermediation—for example, an output shock, as discussed in section 8.3 of the paper. In this example, an excess demand for loans can be generated in several ways, but let's consider the one when it is generated by a negative shock to the production of loans as embodied by a fall in **F**.[3] Clearly, the reduction in the supply of loans is partially offset by an increased effort to make loans, **m**, but ultimately the reduction in the ability to make loans leads to an increased premium on loans, a reduction in the demand for reserves, and a reduction in broad liquidity. The policy response is to reduce the interbank lending rate to help offset the resulting contraction in the balance sheet of the banking sector. In a broader context, the weakness in the banking sector results in a decline in broad liquidity, and the Fed's response of lowering the interbank rate helps to reflate this sector of the economy while keeping inflation on target. Overall, this is not a bad recounting of the Federal Reserve's policy response to the savings and loan crisis of the early 1990s. Clearly, broad money played a role in signaling the nature of the crisis, and banking and financial matters definitely were in play in the FOMC's decisionmaking, a factor that is lost in monetary models that do not have banking, credit, or finance.

The second shock I want to discuss is a shock to the expected future price of capital. Given the intertemporal nature of the market for capital, a fall in the expected future price of capital leads to a decline in the current price of capital, which is discussed in section 8.1 of the paper. As a consequence, collateral falls, and the loan supply process is disrupted; and while loan monitoring rises in response, so does the external finance premium. Accordingly, in response to the decline in collateral, broad liquidity provision is hampered, and the interbank rate must fall to keep the central bank true to its inflation target and to offset the fall in demand for reserves. This scenario is also reasonably consistent with the recession of 2001, in which once again broad liquidity played an important role in signaling financial distress and FOMC decisions were driven by more than simple characteristics of the Taylor rule.

3. To be clear, Goodfriend's paper simultaneously considers several shocks to the broad liquidity sector. Some are from the demand side (velocity shocks), and some are from the supply side (changes in the production of loans, **F**, and regulatory changes in the environment such as changes in capital standards, γ, and changes in reserve requirements, *rr*). Only the changes to **F** and γ lead to unambiguous policy responses for the short-term interbank lending rate. Such differences should be explained better in the paper, as the policy implications are quite important.

While Marvin's paper is helpful in pointing to the role that credit and banking conditions can play in the formulation of monetary policy—indeed even in a monetary policy that is conducted through an interbank market for reserves—it does not give an economic assessment of how important this relationship is. For instance, calculating some theoretical impulse responses from a calibrated version of this model would be quite useful for truly judging the model's contribution. In other words, the theory in Marvin's paper reminds us of the qualitative aspects of the link between monetary policy and banking, but it would also be beneficial to measure the quantitative aspect of this relationship as well.

In conclusion, Marvin's paper reminded me of the best aspects of working as an economist at the Federal Reserve Board. Important policy questions were always on the table, and theoretical approaches to answering them were given a voice by Dale, Dick, and Peter. They should be proud of their contributions to policy and the policymaking process, and they should know that they have our thanks for paving the road to a better monetary policy environment.

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